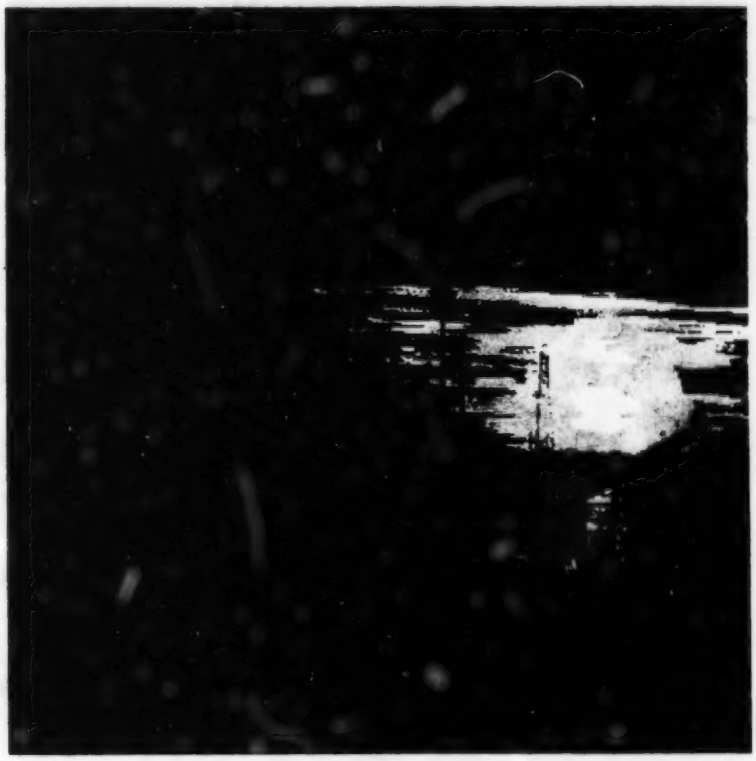
OCCUPATIONAL INJURY AND DISEASE IN ALBERTA

Downhole and Other Oilfield Services 1994 to 1998



Upstream Oil and Gas

Subsector #5

Alberta
HUMAN RESOURCES AND EMPLOYMENT

July 1999

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1. Sub-Sector Description

Sub-Sector # 5: Downhole & Other Oilfield Services

i. Field Production Operators (Industry # 06305)

This industry covers the 'contract' operation of upstream oil and gas production/processing facilities not classified elsewhere. This is primarily a labor service contracted to oil and gas producers for the routine day to day operation of facilities such as those described in industry 6300, including the operation of gas plants.

This is normally a daily responsibility. The duties of oil field production or gas well and battery operators will vary with different companies. Some may only be responsible for checking wellhead equipment. Others may work entirely at the battery and a majority of operators look after both wellhead and battery. If enhanced recovery methods are used on the well, Field Production Operators may operate these units in addition to their other duties.

Duties also include taking pressure and flow reading at the oil well, seeing equipment is running properly, checking flow lines, reading metres, looking for leaks, and may also involve working at the treater plant where samples may be required and reading needed on the levels of oil, gas, water and the addition of chemicals to the unit. At the water disposal unit, metres and gauges are checked, which measure pressure and water capacity levels to ensure there is sufficient space to hold the water coming in from the treating unit. At oil storage tanks, operators check pressure, storage capabilities and levels of the tanks. When gas is involved operators check the Christmas tree which controls the flow and pressure of the well. They inspect valves, take readings of gauges, temperature, pressure and flow rate.

The operators and their helpers are responsible for routine maintenance and light housekeeping duties only when a condition of the contract to operate the facility.

ii. Vacuum Removal-Industrial, Commercial, and Oil Field(industry # 06306)

This industry includes the vacuum truck removal or recovery of industrial by-products, pollutants, hydrocarbons, toxic waste and other liquid waste from oil wells, gas wells, refineries, heavy oil extraction plants, chemical plants and other industrial plants sites. It also includes the cleaning up of fertilizer, grain, sulphur and other dry waste products from industrial and commercial sites such as elevators and rail car derailment sites. Septic tanks and farm waste removal is also part of this industry.

Equipment used ranges in size from a single axle truck with small tank storage and moderate pumping power, to tandem and larger trucks with larger tank capacity and powerful pumping units.

The major feature of this industry is to recover and remove products from an employer's work site. The transportation of the product is an integral part of the services provided.

This industry includes hydro-trenching/hydro-excavating where water is applied under pressure to the ground creating a mud/slurry which is simultaneously vacuumed up by a truck, equipped with both vacuum and water ejection apparatus and holding tank. The purpose is to expose pipe/utilities for further trenching and excavating without causing pipe ruptures.

iii. Mud Logging (Industry # 09900)

Employers engaged in hydrocarbon well/mud logging are included in this industry. Hydrocarbon well/mud logging is a procedure used in oil field drilling to log the strata and other pertinent details on a well during the drilling process.

Drilling mud is a mixture of pulverized barite, clays, chemicals and other various substances. Mud tanks and pumps are used to circulate the mud down the well bore during drilling operation. In addition to bringing cuttings to the surface, drilling mud cools and lubricate the bit and drill stem, protect against blowouts by holding back subsurface pressures, and deposits a mud cake on the wall of the borehole to prevent loss of fluids to the formation

A geological technician sets up at the drill site. Samples of drill cutting and gas, entrapped in the mud, are analysed and the data recorded. They also analyse drill bit performance, rate of penetration and other information related to the drilling operations as required by the oil company. Log data and details are turned over to the oil companies for further study, and decisions concerning the drilling operations are made.

Equipment used to conduct the analysis includes chromatographs, total gas analysers, U.V. box and microscopes.

iv. Pressure Cleaning Services (Industry # 09902)

These are mobile cleaning services conducted with the use of truck-mounted tanks equipped with pressure pumps that eject water, steam, air or hot oil for industrial, commercial or oilfield cleaning purpose.

Industrial and commercial applications will be cleaning of dirt, oil, grease or debris from anything ranging from buildings and plant equipment to rail cars and mobile equipment as well as flushing sewers and drains.
In the oil field, high pressure air, water or steam is used to remove sand, wax and other debris from well site production equipment and storage tanks. This industry also covers pressure services using steam and hot oil treatments to clean paraffin from well casing and includes flush by services where truck mounted masts are used to lift sucker rods to allow a flush of the well.

Hot oil, water and steam treatments can be used for thawing of oil field equipment, storage tanks as well as pipe lines, water and sewer lines.

v. Rathole Drilling And Service Rig Anchoring (Industry # 09904)

Prior to setting up a drilling rig to drill oil and gas wells it is necessary to drill a starter or conductor hole as well as holes for pipe stands known as rat and mouse holes. This is done with truck mounted drilling rigs. This industry is also used to cover the rig anchoring operations which install ground anchors primarily to secure service rigs during operations and also to secure flare stacks.

The oil company, or contractor arranges site survey and access to the area, and indicates where the holes are to be drilled. Unlike drilling or service rigs, where sections of the drill stem are used, a one piece truck mounted auger is used in these operations. Three holes are drilled from 16 to 36 inches in diameter depending on requirements.

A conductor hole is drilled to a depth of 30 to 40 feet (the deepest may be 60 feet, but this is rare). A 16 or 19 inch pipe, or casing is put into the hole and cemented around the outside to hold it in place. The conductor hole is the main drill hole that the drilling rigs start their drilling operations in.

Anchoring is relatively new industry which was spawned by changes to safety regulations governing the set up of service rig. Rig anchoring services are completed with the use of truck mounted equipment, which will screw an auger type piece of iron into the ground until solid base is reached. The anchor is pull tested at 15 to 20,000 lbs. Safety cables are then used to secure service rigs or flare stacks to the anchors. Anchoring companies do not usually fasten the cables.

vi. Oil field Downhole Services (Industry # 09911)

This industry covers a wide spectrum of oilfield downhole services related to well completion, stimulation, testing and wireline services. This industry does not cover well servicing operations with the use of well servicing rigs. Employers in this industry usually offer a multitude of the above service to their clients with a variety of equipment, down hole tools and truck mounted units.

Services in this industry can include:

Directional drilling services involve only the supply of equipment and specialized supervision to the oil company. This work is done during the drilling process with the physical work or actual drilling done by the drilling crew.

Wireline services involve lowering special instruments into the well for testing purpose. A wireline may also be used to pull instrument or scrape debris out of the well.

Oil and gas well perforating involves lowering explosive device into the well on a wire line. When the required depth is reached, the device is detonated by an electric current. The explosive perforates the well casing, allowing the flow of oil at different levels.

Well testing activities include testing production levels. Production testing is performed by compressor equipment, usually truck mounted, which introduces water, air, or nitrogen into the line under high pressure and records information on pressure instruments. A separator may also be used to test flow or proportion of gas/oil and water in the flow.

Smaller hand held recording instruments may also be used for testing purposes. Dynamometers are surface instrument used to test downhole pumps and pump jack performance. Echometers are a downhole instrument used to log fluid levels and require the discharge of blank shell to generate shock waves which are then recorded.

After a shot hole has been drilled, the hole is usually never used again and must be closed for environmental reasons. Shot hole cementers place a plug part way down the hole, then fill the hole with cement from the plug to the surface. *Cementing* also involves pumping cement downhole to secure the well casing.

Fracturing is the process of forcing, under high pressure, a mud-sand slurry with carbon dioxide or nitrogen to expand or fracture the formation, allowing the oil or gas to escape the well.

Chemical treatment involve forcing/injecting stimulation fluids into the well casing to clear contaminants, remove paraffin and hydrates for well stimulation.

Under balanced drilling is a down hole process where lighter drilling fluids are used to lubricate the drilling bit and drill stem. The purpose of this process is to reduce cost and reduce the need for well stimulation in completing the well.

vii. Well Casing Services (Industry # 09915)

This industry is intended to cover those employers who engage in a variety of services related functions on active drilling rigs.

Employers classified in this industry may engage in any one or more of the following activities:

Oil and Gas Well Power Tong Operations: Involves the use of large truck mounted hydraulic tongs to screw together or break apart sections of pipe (or casing) when being placed in, or removed from the drill hole.

Hydraulically operated Snubbing Units: units are truck mounted and are used to move tubular products in and out of the oil or gas well which has pressure at the surface ('live well'). There is a hydraulic jack which clamps on to the pipe to control and overcome the forces on the tubular goods exerted by the well bore pressure. By moving the jack up and down, and releasing and resetting the clamps, the tubulars can be put into or removed from the well bore. The second part of the Snubbing Units are the blow-out preventers which are also hydraulically operated and are used to control the pressure on the well. Snubbing services are used primarily in work overs and

well completions; however, drilling contractors may also require their services.

Cleaning of Pipe Threads at Well Site: prior to the casing being placed in the well hole, the pipe threads must be cleaned. Well casing crews clean the pipe threads using varsol, wire brushes and rags.

Transport Pipe at Drill Site: Pipe (or casing), found on a pipe rack approx. 100 feet away from the drilling rig, is transported to the rig floor by a carrier suspended on a wire cable running from a winch permanently mounted on a truck. These units used to transport the pipe are referred to as pickup/lay down units.

Torque Monitoring: using a gauge or a computer monitoring system the amount of torque applied when joining two joints of pipe together by means of power tong is monitored and controlled.

Employers that install blow-out preventers are also included in this industry.

viii. Servicing Christmas Trees on Oil Wells by Means of a Tree Saver (Industry # 09921)

An oil well 'Christmas tree' is a series of pipes and valves that are situated on the well head after drilling of the well has been completed. This equipment need to be protected when fracturing a well.

The tree saver is a heavy gauged piece of pipe (approximately 2 metres long, 5 centimetres in diameter and weighs 90 kilograms), which is inserted through the Christmas tree and into the well tubing to prevent the fracturing fluid from wearing away at the valves and parts of the Christmas tree. The saver is held in place by means of a bolted coupling and rubber sleeve.

ix. Liquid Waste Treatment & Disposal (industry # 09927)

Employers in this industry are engaged in the chemical treatment and disposal of water in sump pits located on oil and gas well drilling sites. It should be noted that employers who pump water to the drilling rig, from a nearby water source, by means of pumps and irrigation piping are also classified in this industry. The equipment used is the same as that of employers pumping water out of a sump pit, and it is part and parcel of the water system used in the drilling process.

Samples of the sump water are analysed by independent laboratories to determine what treatment program may be implemented so as to separate the solid wastes from the liquid, and to make the liquid safe for return to the environment. The treatment program must be approved by the Energy Resources Conservation Board prior to its implementation. Once the waste treatment company has applied the recommended program, they must then send in a sample of the treated sump liquid to the E.R.C.B., who must verify that the treatment was successful. Once approved, the water is pumped out of the sump pit into the surrounding environment. The solid wastes are often not harmful to the environment, and therefore left in the sump pit.

Some employers will use a mechanical system (referred to as a centrifuge) through which they pump the sump pit waste in order to separate the solids from the liquids. Chemicals required to remove any impurities from the water are added to the system. The same E.R.C.B. standards discussed above must be adhered to.

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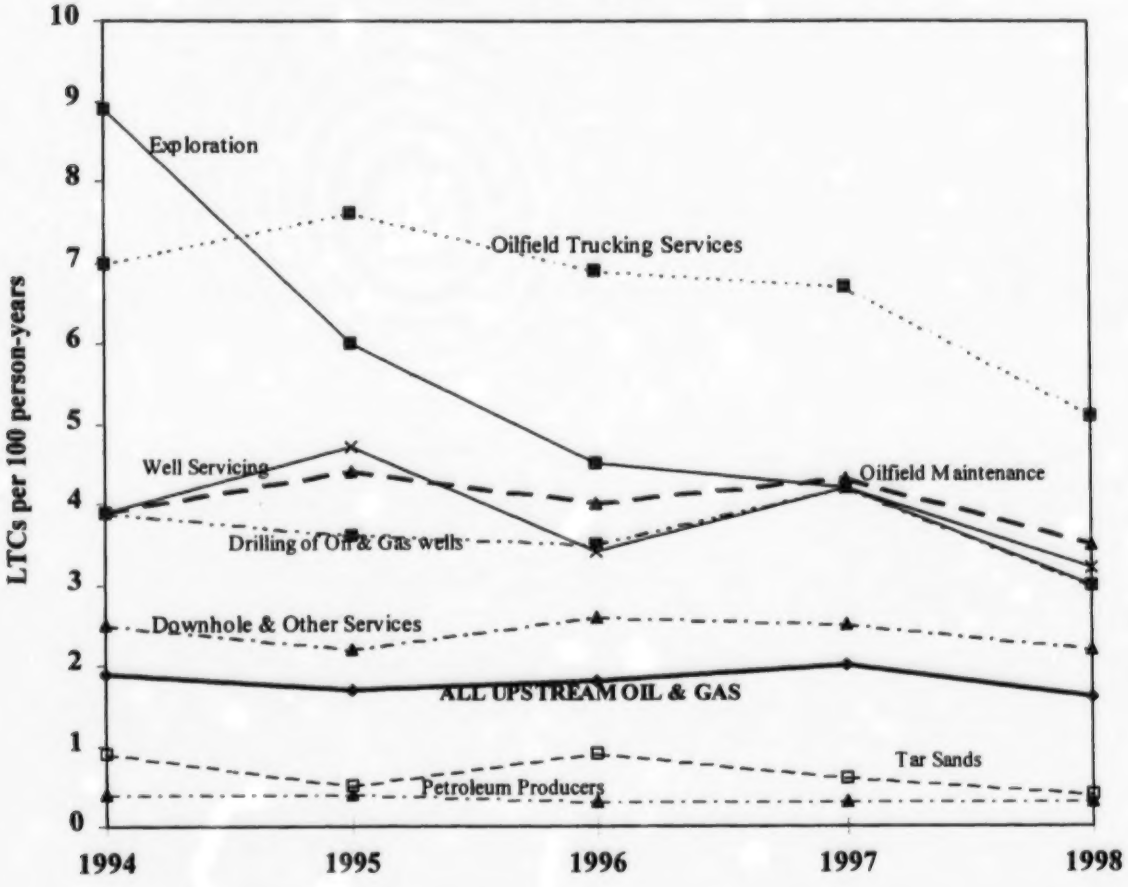
2.

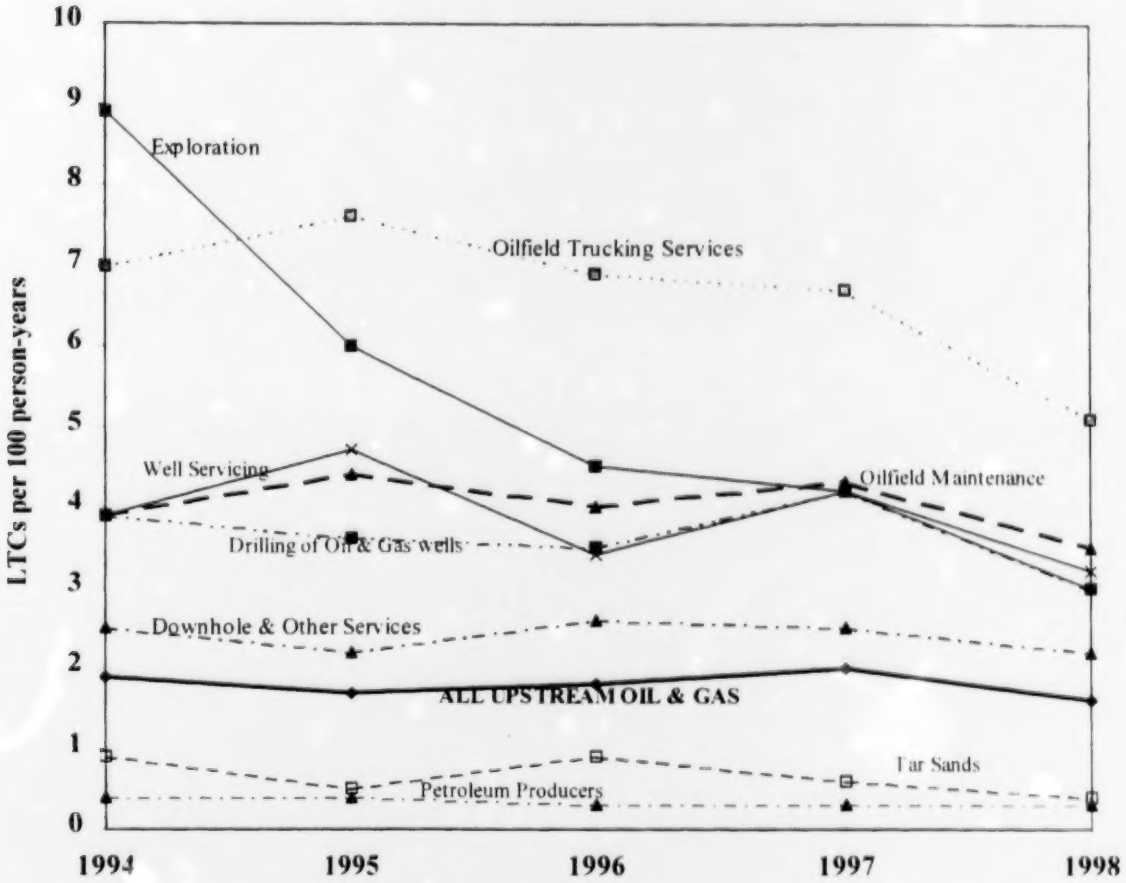
Lost-Time Claim Rates
All Upstream Oil & Gas Subsectors
Alberta 1994-1998



Lost-Time Claim Rate	1994	1995	1996	1997	1998
Exploration	8.9	6.0	4.5	4.2	3.0
Oilfield Maintenance and Construction	3.9	4.4	4.0	4.3	3.5
Well Services with Service Rigs	3.9	4.7	3.4	4.2	3.2
Drilling of Oil and Gas	3.9	3.6	3.5	4.2	3.0
Downhole & Other Oilfield Services	2.5	2.2	2.6	2.5	2.2
Tar Sands	0.9	0.5	0.9	0.6	0.4
Petroleum Producers	0.4	0.4	0.3	0.3	0.3
Oilfield Trucking Services	7.0	7.6	6.9	6.7	5.1

2.

Lost-Time Claim Rates
All Upstream Oil & Gas Subsectors
Alberta 1994-1998



Lost-Time Claim Rate	1994	1995	1996	1997	1998
All Upstream Oil and Gas	**1.9**	**1.7**	**1.8**	**2.0**	**1.6**
Exploration	8.9	6.0	4.5	4.2	3.0
Oilfield Maintenance and Construction	3.9	4.4	4.0	4.3	3.5
Well Services with Service Rigs	3.9	4.7	3.4	4.2	3.2
Drilling of Oil and Gas	3.9	3.6	3.5	4.2	3.0
Downhole & Other Oilfield Services	2.5	2.2	2.6	2.5	2.2
Tar Sands	0.9	0.5	0.9	0.6	0.4
Petroleum Producers	0.4	0.4	0.3	0.3	0.3
Oilfield Trucking Services	7.0	7.6	6.9	6.7	5.1

3. LTC Rates & Duration Rates

Oilfield Downhole Services

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	1,576	$2,009,713	12,093	13,405	111	303	2.5
95	1,914	$2,662,758	12,528	11,259	90	277	2.2
96	2,139	$2,253,290	14,151	14,252	101	366	2.6
97	2,590	$2,652,673	17,275	14,949	87	438	2.5
98	2,942	$3,959,219	17,374	19,077	110	388	2.2

3.1 LTC Rates by Industry

Field Production Operators

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	502	$61,219	916	373	N/A	11	1.2
95	694	$30,645	1,075	375	N/A	10	0.9
96	839	$235,150	1,371	1,399	N/A	21	1.5
97	1,058	$230,267	1,626	659	N/A	21	1.3
98	1,197	$182,036	1,783	1,055	N/A	27	1.5

Vacuum Removal - Wet/Dry Waste

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	258	$136,529	570	1,297	227	32	5.6
95	292	$88,308	633	882	N/A	25	3.9
96	320	$217,772	743	2,200	296	46	6.2
97	415	$403,141	1,105	2,187	198	57	5.2
98	479	$300,782	1,163	2,605	224	55	4.7

Mud Logging Services

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	56	$15,091	404	137	N/A	4	1.0
95	71	$0	438	0	N/A	0	0.0
96	17	$8,765	124	118	N/A	3	2.4
97	18	$6,319	142	34	N/A	2	1.4
98	22	$5,057	146	64	N/A	1	0.7

Cleaning Services - Mobile Pressure

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	321	$425,489	951	2,781	293	50	5.3
95	354	$320,593	1,098	2,223	202	56	5.1
96	395	$325,555	1,121	2,403	214	57	5.1
97	437	$265,686	1,428	2,088	146	44	3.1
98	471	$462,280	1,327	2,764	208	53	4.0

Drilling - Rathole/Rig Anchor

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	42	$8,011	197	101	N/A	3	1.5
95	47	$92,517	223	392	N/A	4	1.8
96	53	$89,707	230	654	N/A	11	4.8
97	63	$35,475	290	321	N/A	9	3.1
98	59	$107,491	206	608	N/A	7	3.4

Oilfield Downhole Services

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	302	$1,196,941	8,740	7,234	83	178	2.0
95	351	$1,992,165	8,745	5,918	68	164	1.9
96	393	$1,059,191	10,114	6,047	60	209	2.1
97	455	$1,373,126	12,077	7,751	64	268	2.2
98	546	$2,601,897	12,156	10,356	85	223	1.8

Well Casing Services

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	73	$138,945	194	1,171	N/A	19	9.8
95	85	$103,159	190	1,057	N/A	13	6.8
96	96	$287,394	290	1,000	N/A	15	5.2
97	110	$307,372	386	1,606	416	30	7.8
98	124	$294,471	374	1,573	N/A	21	5.6

Oilfield Services - Christmas Trees

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	5	$4,462	75	59	N/A	2	2.7
95	5	$5,369	72	98	N/A	1	1.4
96	7	$49,220	90	426	N/A	3	3.3
97	9	$7,413	133	71	N/A	2	1.5
98	10	$0	121	0	N/A	0	0.0

Oilfield Liquid Waste Treatment & Disposal

Year	# of Accounts	Cost	Person Years	Days Lost	Duration Rate	LTCs	LTC Rate
94	17	$23,027	47	252	N/A	4	8.6
95	15	$30,003	56	314	N/A	4	7.2
96	19	$534	68	5	N/A	1	1.5
97	25	$23,673	88	232	N/A	5	5.7
98	34	$5,204	97	52	N/A	1	1.0

3.2 LTC Rates by Size of Employer:1998

Size of Employer	# of Accounts	LTCs	Person - Years	LTC Rate
A: 0< PYs <=1	1,458	18	738	2.4
B: 1 < PYs < 5	935	52	1,846	2.8
C: 5 <= PYs < 10	171	34	1,183	2.9
D: 10 <= PYs < 20	97	38	1,372	2.8
E: 20 <= PYs < 40	43	35	1,290	2.7
F: 40 <= PYs < 100	25	27	1,507	1.8
G: PYs >=100	24	180	9,438	1.9
H: Invalid	189	4	0	N/A
Total	2,942	388	17,374	2.2

4. Analysis of The Lost-Time Claims

4.1 Nature of Injury

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
SPRAIN, STRAIN	117	105	127	192	153	694	39.2
FRACTURE & DISLOCATION							
FRACTURE	51	39	54	62	72	278	15.7
OTHER NATURE	6	1	4	8	10	29	1.6
SUBTOTAL	57	40	58	70	82	307	17.3
BRUISE, CONTUSION, CRUSHING	41	34	43	50	36	204	11.5
OTHER INJURY	8	11	33	30	34	116	6.5
CUT, LACERATION, PUNCTURE	20	21	10	23	22	96	5.4
OTHER DISEASE	2	7	26	21	13	69	3.9
BURN, SCALD-THERMAL	14	6	17	11	15	63	3.6
MULTIPLE INJURIES	11	17	7	7	9	51	2.9
CHEMICAL BURN	6	10	7	7	9	39	2.2
ALL OTHER NATURES, UNS	27	26	38	27	15	133	7.5
Total	303	277	366	438	388	1,772	100.0

4.2 Part of Body Affected

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
BACK							
LUMBAR (LOWER BACK)	55	44	20	13	15	147	8.3
OTHER PART	24	28	88	113	78	331	18.7
SUBTOTAL	79	72	108	126	93	478	27.0
OTHER TRUNK							
SHOULDER(S)	22	6	21	22	18	89	5.0
CHEST-INCLUDES INTERNAL ORGANS	7	11	12	11	17	58	3.3
HIP(S)-INCUDES PELVIC ORGANS	9	8	10	11	12	50	2.8
OTHER PART	4	5	2	7	3	21	1.2
SUBTOTAL	42	30	45	51	50	218	12.3
ANKLE(S) & FOOT(FEET)-NOT TOES							
ANKLE(S)	28	20	22	19	32	121	6.8
FOOT(FEET)-NOT ANKLES OR TOES	17	9	17	15	15	73	4.1
SUBTOTAL	45	29	39	34	47	194	10.9
LEG(S)							
KNEE	17	16	18	30	20	101	5.7
OTHER PART	14	8	10	12	12	56	3.2
SUBTOTAL	31	24	28	42	32	157	8.9
FINGER(S)	24	26	28	33	37	148	8.4
MULTIPLE MAJOR BODY PARTS	10	20	32	33	27	122	6.9
OTHER HEAD, NECK							
NECK	12	11	9	24	11	67	3.8

(CONTINUED)

Part of Body Affected(continued)

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
OTHER HEAD, NECK							
OTHER PART	8	8	11	6	13	46	2.6
SUBTOTAL	20	19	20	30	24	113	6.4
WRIST(S) & HAND(S)-NOT FINGERS							
HAND(S)-NOT WRISTS OR FINGERS	7	10	7	22	15	61	3.4
WRIST(S)	8	9	10	12	12	51	2.9
SUBTOTAL	15	19	17	34	27	112	6.3
ARM(S)(ABOVE WRIST)	12	11	18	12	9	62	3.5
FACE	12	3	10	19	17	61	3.4
EYE(S)-OPTIC NERVE, VISION	10	14	12	12	9	57	3.2
ALL OTHER PARTS, UNS	3	10	9	12	16	50	2.8
Total	303	277	366	438	388	1,772	100.0

4.3 Source of Injury

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
SOURCE-UNS	51	52	91	71	72	337	19.0
VEHICLES							
HIGHWAY VEHICLES (POWERED)	45	35	51	67	41	239	13.5
OTHER SOURCE	4	2	10	11	13	40	2.3
SUBTOTAL	49	37	61	78	54	279	15.7
WORKING SURFACES							
GROUND (OUTDOORS)	16	12	18	26	21	93	5.2
OTHER SOURCE	17	21	22	32	22	114	6.4
SUBTOTAL	33	33	40	58	43	207	11.7
METAL ITEMS-NEC							
PIPE AND FITTINGS	17	16	22	29	24	108	6.1
OTHER SOURCE	21	19	16	9	17	82	4.6
SUBTOTAL	38	35	38	38	41	190	10.7
BODILY MOTION	32	33	34	43	45	187	10.6
HANDTOOLS-UNPOWERED	19	16	10	21	18	84	4.7
BOXES, CONTAINERS	8	12	8	18	17	63	3.6
CHEMICAL	6	12	14	14	13	59	3.3
BOILERS & PRESSURE VESSELS							
PRESSURE LINES-HOSE,PIPE	14	7	7	18	8	54	3.0
OTHER SOURCE	1	.	1	.	1	3	0.2
SUBTOTAL	15	7	8	18	9	57	3.2
MACHINES	5	4	9	9	11	38	2.1
ALL OTHER SOURCES	47	36	53	70	65	271	15.3
Total	303	277	366	438	388	1,772	100.0

4.4 Type of Event

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
OVEREXERTION							
LIFTING OBJECTS	27	27	39	43	44	180	10.2
PULLING/PUSHING OBJECTS	8	5	8	21	7	49	2.8
OTHER TYPE	24	11	20	24	21	100	5.6
SUBTOTAL	59	43	67	88	72	329	18.6
STRUCK BY							
STRUCK BY FLYING OBJECT	1	4	19	27	23	74	4.2
OTHER TYPE	49	32	20	33	38	172	9.7
SUBTOTAL	50	36	39	60	61	246	13.9
VEHICLE INCIDENTS							
HIGHWAY-OVERTURNED VEHICLE	7	14	10	20	9	60	3.4
OTHER TYPE	27	19	33	37	32	148	8.4
SUBTOTAL	34	33	43	57	41	208	11.7
BODILY REACTION							
REACTION FROM INVOLUNTARY MOTION	22	21	12	21	20	96	5.4
REACTION FROM VOLUNTARY MOTION	9	5	18	17	14	63	3.6
OTHER TYPE	1	7	6	5	9	28	1.6
SUBTOTAL	32	33	36	43	43	187	10.6
FALL FROM ELEVATION							
FALL FROM VEHICLES	12	10	18	17	17	74	4.2
OTHER TYPE	22	9	18	25	17	91	5.1
SUBTOTAL	34	19	36	42	34	165	9.3
FALL ON SAME LEVEL							
FALL TO WALKWAY, WORKING SURFACE	7	17	11	16	17	68	3.8
FALL ONTO OR AGAINST OBJECTS	10	8	9	5	11	43	2.4
OTHER TYPE	.	1	2	5	1	9	0.5

(CONTINUED)

Type of Event(continued)

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
FALL ON SAME LEVEL							
SUBTOTAL	17	26	22	26	29	120	6.8
CAUGHT IN, UNDER OR BETWEEN	19	18	20	37	24	118	6.7
CONTACT NOXIOUS SUBSTANCE							
ABSORB NOXIOUS SUBSTANCES	6	13	7	9	8	43	2.4
OTHER TYPE	.	3	3	4	6	16	0.9
SUBTOTAL	6	16	10	13	14	59	3.3
TEMPERATURE EXTREMES							
HOT OBJECTS/SUBSTANCES	12	5	10	8	9	44	2.5
OTHER TYPE	2	1	3	.	.	6	0.3
SUBTOTAL	14	6	13	8	9	50	2.8
STRUCK AGAINST	10	7	12	9	11	49	2.8
ALL OTHER TYPES, UNS	28	40	68	55	50	241	13.6
Total	303	277	366	438	388	1,772	100.0

4.5 Duration of Disability

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
01 - 05 DAYS LOST	57	57	87	115	98	414	23.4
06 - 10 DAYS LOST	43	42	43	71	55	254	14.3
11 - 15 DAYS LOST	21	24	36	37	33	151	8.5
16 - 20 DAYS LOST	19	20	21	19	19	98	5.5
21 - 30 DAYS LOST	19	23	39	35	27	143	8.1
31 - 40 DAYS LOST	26	22	16	25	21	110	6.2
41 - 50 DAYS LOST	24	11	15	21	24	95	5.4
51 OR MORE DAYS LOST	90	67	91	94	93	435	24.5
DAYS LOST-UNSPECIFIED, 0	4	11	18	21	18	72	4.1
Total	303	277	366	438	388	1,772	100.0

5. Characteristics of The Injured Worker

5.1 Occupation of Injured Worker

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
TRANSPORT OPERATORS							
TRUCK DRIVERS	54	62	80	107	90	393	22.2
OTHER OCCUPATION	2	.	1	.	2	5	0.3
SUBTOTAL	56	62	81	107	92	398	22.5
OIL & GAS FIELD, MINING							
ROTARY WELL DRILLING	16	11	18	12	32	89	5.0
OIL & GAS, MINING-NEC	23	15	5	17	15	75	4.2
LABOR-OIL & GAS, MINING	6	9	8	5	14	42	2.4
OTHER OCCUPATION	7	7	6	15	9	44	2.5
SUBTOTAL	52	42	37	49	70	250	14.1
OCCUPATION-NEC							
LABOR-NEC	3	12	6	15	16	52	2.9
OTHER OCCUPATION	2	1	4	7	8	22	1.2
SUBTOTAL	5	13	10	22	24	74	4.2
CONSTRUCTION OCCUPATIONS	13	11	12	18	19	73	4.1
PROFESSIONAL							
ARCHITECTURE & ENGINEERING-NEC	12	6	2	12	7	39	2.2
OTHER OCCUPATION	4	7	7	7	5	30	1.7
SUBTOTAL	16	13	9	19	12	69	3.9
PROCESSING	14	11	7	15	19	66	3.7
FABRICATING, REPAIR	16	7	15	7	21	66	3.7
MATERIALS HANDLING-NEC	11	6	9	19	11	56	3.2
MACHINING	7	5	7	12	5	36	2.0
ALL OTHER OCCUPATIONS, UNS	113	107	179	170	115	684	38.6
Total	303	277	366	438	388	1,772	100.0

5.2 Age of Injured Worker

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
15-19 YEARS	12	16	15	14	11	68	3.8
20-24 YEARS	61	57	59	88	68	333	18.8
25-34 YEARS	122	107	151	158	144	682	38.5
35-44 YEARS	79	66	97	132	116	490	27.7
45-54 YEARS	18	20	36	35	35	144	8.1
55-64 YEARS	9	11	7	10	12	49	2.8
65 YRS AND OVER	.	.	1	1	2	4	0.2
AGE-UNSPECIFIED	2	.	.	.	.	2	0.1
Total	303	277	366	438	388	1,772	100.0

5.3 Length of Time Employed

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
A. LESS THAN 1 MONTH	31	30	22	41	34	158	8.9
B. 1 MONTH TO < 6 MONTHS	94	71	73	113	92	443	25.0
C. 6 MONTHS TO < 1 YEAR	55	63	39	55	57	269	15.2
D. 1 YEAR OR MORE	85	78	129	119	109	520	29.3
E. TIME-UNSPECIFIED	38	35	103	110	96	382	21.6
Total	303	277	366	438	388	1,772	100.0

5.4 Gender of Injured Worker

LOST-TIME CLAIMS ALBERTA: 1994 TO 1998	OCCURRENCE YEAR					Total	
	94	95	96	97	98	Number	Percent
MALE	296	273	353	427	375	1,724	97.3
FEMALE	7	4	5	5	7	28	1.6
GENDER-UNSPECIFIED	.	.	8	6	6	20	1.1
Total	303	277	366	438	388	1,772	100.0

6. Number of Employers that Received/Renewed a CoR in 1998

	Certified Employers	Cert. & Uncert. (# of Accounts)	% Certified
Sub-Sector # 5			
Industry 06305-Field Production Operations	2	1,197	
Industry 06306-Vacuum Removal of Waste	9	479	
Industry 09900-Mud Logging	0	22	
Industry 09902-Pressure Cleaning Services	9	471	
Industry 09904-Rathole Drilling/Rig Services	4	59	
Industry 09911-Downhole Services	23	546	
Industry 09915-Well Casing Services	1	124	
Industry 09921-Servicing Christmas Trees	1	10	
Industry 09927-Liquid Waste Treatment	1	34	
Downhole & Other Oilfield Services	**50**	**2,942**	**1.7%**
UPSTREAM OIL & GAS SECTOR	**19**	**7,205**	**1.7%**

7. Cost of Claims, Payroll & Premiums

	Occurrence Year				
	1994	**1995**	**1996**	**1997**	**1998**
Transaction Year					
1994	$1,597,618				
1995	$1,123,627	$1,634,885			
1996	$754,032	$1,130,919	$1,844,426		
1997	$491,970	$555,162	$1,037,427	$2,269,636	
1998	$673,770	$971,863	$902,748	$1,140,489	$2,759,755
Total Cost	$4,641,016	$4,292,830	$3,784,601	$3,410,125	$2,759,755
Total Payroll	$322,914,937	$359,499,452	$413,438,961	$525,327,328	$546,844,340
Total Premiums	$10,005,407	$9,488,403	$9,696,931	$11,742,067	$8,343,364

The above costs of claims, payroll and premiums are for the five year period 1994 through 1998. The data is as at July, 1999.

The claim cost amount reflect only paid costs on claims which have occurred in the five year period. These paid cost are tracked by year of occurrence and year that the cost were transacted.

The payroll have been totaled for each year. The premiums is the total of employer's premiums paid for each year.

8. Occupational Fatalities

An occupational fatality is the death of a worker which results from a work-related incident or exposure. Alberta Labour classifies occupational fatalities into three general types: motor vehicle incident, workplace incident and occupational diseases. Each is described in detail below.

Motor Vehicle Incident
Motor vehicle incident typically involve highway vehicles operating on public roads in which the fatally injured worker was either the driver or a passenger. This category also includes fatalities involving air plane crashes, train crashes, helicopter crashes. etc.

Workplace Incident
Fatal workplace incidents consists of cases in which the worker dies at a work site, or as a result of injuries sustained at a work site. It is this type of fatality that Alberta Labour may be responsible for investigating.

Occupational Diseases
Occupational disease fatalities consist mostly of recognized occupational disease, that is, disease known to be primarily or exclusively work-related (e.g. asbestosis, black lung disease). Occupational diseases are frequently diagnosed many years after the initial or crucial exposure to the toxic substance, and in such cases it is very difficult to determine when the fatal exposure occurred. Thus, the occupational disease category, should not be interpreted to reflect present work site hazardous conditions or exposures.

Each year the Workers' Compensation Board (WCB) accepts some occupational fatality claims for compensation. Claims accepted in a particular year does not imply the fatalities occurred in that year.

Description of Oilfield Downhole Services Fatalities
Accepted by the WCB
Alberta 1992-1998

Year	Occupational Disease		Motor Vehicle incident		Workplace Incident		Total	
	N	%	N	%	N	%	N	%
1992	0	0.0	0	0.0	0	0.0	0	100
1993	0	0.0	0	0.0	2	100.0	2	100
1994	0	0.0	2	66.7	1	33.3	3	100
1995	0	0.0	3	75.0	1	25.0	4	100
1996	0	0.0	1	33.0	2	66.7	3	100
1997	0	0.0	4	80.0	1	20.0	5	100
1998	0	0.0	3	60.0	2	40.0	5	100
Total	0	0.0	13	59.1	9	40.9	22	100

9. OHS Investigated Occupational Fatalities: 1993 to 1998

YEAR:	1993	FILE:	0764
OCCUPATION:	Vacuum Truck Driver	AGE:	33
INDUSTRY:	Vacuum Removal Wet and Dry Waste		
EXPERIENCE:	2 Years		

DESCRIPTION: A service company was performing a sand clean out of a well. Operations included pulling a wet string (pipe with sand and oil inside). This operation was aided by a vacuum truck and a mud can to contain the fluids. A blow plug was used to hold the fluids in the string. The worker assisted by retrieving the blow plug when it was thrown down from the derrick after removal. After acknowledging that the blow plug was being thrown to the pickup area, the worker turned and either slipped, tripped or fell under the path of the blow plug.

YEAR:	1993	FILE:	0771
OCCUPATION:	Swamper	AGE:	37
INDUSTRY:	Rathole Drilling, Oil & Gas		
EXPERIENCE:	9 months		

DESCRIPTION: A worker was killed when struck on the head by a drill pipe. The pipe was being loaded onto a truck at the time. The probable causes of this accident were poor loading techniques for pipes of various diameters; failure to secure all pipe prior to disengaging pipe from drill unit's tail chains; and lack of communication between the two workers. Written safe work procedures for loading of pipe of various diameters will be developed by the company.

YEAR:	1994	FILE:	0791
OCCUPATION:	Backhoe Operator	AGE:	34
INDUSTRY:	Vacuum Removal, Wet & Dry Waste		
EXPERIENCE:	number of years unknown		

DESCRIPTION: A worker was killed in a trench cave-in. The deceased had started repairing the sewer system on a private residence in the morning. The residence was a farm property. The deceased was attempting to locate the sewer line using a backhoe. Once located, he was going to enter the sewer to tie into the line and extend it out. He was working alone. In the afternoon, one of the home owners went out to see how the job was progressing he found the backhoe running, and the deceased missing. The trench was caved in.

YEAR:	1994	FILE:	0796
OCCUPATION:	Swamper	AGE:	20
INDUSTRY:	Oilfield Downhole Services		
EXPERIENCE:	3 weeks		

DESCRIPTION: A worker was killed when the wellhead on a shallow gas well spun off struck him in the head. A second worker was seriously injured. The workers were venting the well prior to servicing it when the accident occurred.

FILE: 0821
AGE: 18

YEAR: 1995
OCCUPATION: Swamper
INDUSTRY: Oilfield Downhole Services
EXPERIENCE: 4 months

DESCRIPTION: The lease owner of the site, had completed the drilling of an oilwell at the location of the incident and had contracted the services of a consultant to arrange for a service rig to come on the site to bring the well into production. The equipment was delivered to the site when the incident occurred. Two workers, a truck driver/picker operator and his helper(swamper) were unloading a set of service rig pipe racks from a flatbed trailer. The driver lowered the picker's outriggers, positioned the boom and lowered the hook to get ready to hook up to the pipe racks. The driver was storing the tie down chains and boomers on the rear of the tractor cab. The swamper climbed up on the flatbed and removed the rear tie down chain on the load. The front tie down chain fell to the ground and the right pipe rack tipped off the load. The swamper tried to grab the rack which was tipping. The right pipe rack (which was attached to the left rack by a chain) fell off the trailer pulling the left rack and the swamper with it. The pipe racks fell and landed on the swamper causing fatal injuries.

FILE: 0872
AGE: 33

YEAR: 1997
OCCUPATION: Truck Driver
INDUSTRY: Field Production Operators
EXPERIENCE: one week with company

DESCRIPTION: The driver was employed with the trucking company to haul methanol to gas leases. The driver attempted to enter the gas lease and his truck became stuck. The lease operator radioed for a caterpillar to pull the truck out. The lease operator and the driver unloaded the methanol and the former left to perform other duties. The cat operator arrived and proceeded to unload the cat off the truck and then backed down the road a short distance. He moved the cat forward through a ditch and a grassy area to the front of the methanol truck. As he manoeuvred the cat in front of the truck, he saw a dark form on the grass. Upon checking, he discovered that the truck driver had been run over by the caterpillar.

There is one fatality in 1998 that is still under investigation

Appendix A: Terms, Definitions, and Formulas

Lost-Time Claim

A lost-time claim (LTC) is a claim for an occupational injury or disease which disables the worker beyond the day of injury. Included are claims for which wages compensation are paid, permanent disability claims, fatalities, and cases in which the injured worker is assigned light duties or other modified work.

Person-Years

Person-year estimates are calculated from wage and payroll data provided by account holders to the WCB. Alberta Labour uses these data to estimate. An average industry wage, and uses the average industry wage and employer payroll data to estimate person-years foe each employer and each industry. One person-year ie equivalent to one full-time worker working for one year, and can be assumed to equal 2,000 hours worked.

LTC Rate

The lost-time claim (LTC) rate is calculated by dividing the number of lost-time claims by the person-year estimate, and multiplying the result by 100. The LTC rate represent the probability or risk of disabling injury or disease to a worker during a period of one year's work. Comparisons of LTC rates between industries, or between years, can be used to indicate increases, decreases, or differences in this risk.

$$\text{LTC Rate} = \frac{\text{Number of LTCs X 100}}{\text{Estimated Person-years}}$$

Duration (Days Lost)

The duration of disability is the number of days following the injury or disease for which the worker was disabled, and unable to perform normal work duties. This information is obtained for this report from data on compensation days paid on each claim from WCB. Alberta Labour obtains these data on March 31 of the year following the claim year, and does not update the information, even though many injured workers continue to be disabled beyond this date. As a result, the duration information reported here underestimates the true impact of lost-time injury and disease.

Duration Rate

The duration rate is calculated by dividing the number of work days lost (disability days) by the person-year estimate, and multiplying by 100. The result is expressed as "days lost per 100 person-years worked", and indicates, in part, the economic impact of occupational injury and disease. Duration rates are not recommended as reliable indicators of full economic cost. In addition, readers are warned that duration rates are highly unstable when based on only a few lost-time claims; it is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.

$$\text{Duration Rate} = \frac{\text{Disability Days X 100}}{\text{Estimated Person-Years}}$$

WCB Accepted Fatality

An occupational fatality is the death of a worker which result from a work-related incident or exposure and which has been accepted by the WCB for compensation. A fatality is counted in the year it is accepted.

NEC

Means "Not Elsewhere Classified"

UNS

Means "Unspecified"

Appendix B: Upstream Oil and Gas 1998 Industry Codes

Sub-Sector 1:
Industries:

Exploration
09200~Seismic Geophysical/Mineral Exploration
09201~Shot Hole Drilling

Sub-Sector 2:
Industries:

Oilfield Maintenance and Construction
06304~Oilfield Construction and/or Maintenance

Sub-Sector 3:
Industries:

Well Servicing With Service Rigs
09903~Well servicing with Service Rigs including Power Swivels

Sub-Sector 4:
Industries:

Drilling of Oil and gas Wells
09600~Drilling of Oil & Gas Wells

Sub-Sector 5:
Industries

Downhole & Other Oilfield Services
06305~Field Production Operators
06306~Vacuum Removal of Waste
09900~Mud Logging
09902~Pressure Cleaning Services
09904~Rathole Drilling and Rig Anchoring
09911~Oilfield Downhole Services
09915~Well Casing Services
09921~Servicing Christmas Trees On Oil Wells
09927~Liquid Waste Treatment & Disposal

Sub-Sector 6:
Industries:

Tar Sands
06600~Mining & Processing of Bituminous Sand
06601~Research/Development, Oil Sands and Heavy Oil Recovery

Sub-Sector 7:
Industries:

Oil & Gas Exploration/Development
06300~Oil and Gas Exploration & Development-Upstream Operations

Sub-Sector 8:
Industries:

Oilfield Trucking Services
50720~Oilfield Trucking Services